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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/308,032	08/13/1999	BART DIERICKX	IMEC169.001A	5620

7590 04/09/2003

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EXAMINER

GENCO, BRIAN C

ART UNIT	PAPER NUMBER
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2615

DATE MAILED: 04/09/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No. 09/308,032	Applicant(s) DIERICKX ET AL. v	
	Examiner Brian C Genco	Art Unit 2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 6-8 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 6-8 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____. | 6) <input type="checkbox"/> Other: |

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DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Regarding claim 7, the phrase "possibly" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out

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the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-4 and 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over (USPN 5,434,619 to Yonemoto) in view of (USPN 5,311,320 to Hashimoto).

In regards to claim 1 Yonemoto discloses an image sensor comprising an array of rows and columns of pixels, all the pixels of one column of the array being connected to at least one common pixel output line (e.g., See Fig. 3) having at least one memory element (e.g., element 6b of Fig. 3) and at least a first amplifying element (e.g., element 7a of Fig. 3), all of these amplifying elements being connected to a common output (e.g., subtracter 10 of Fig. 3), characterized in that the sensor further comprises:

a second amplifying element (e.g., element 7b of Fig. 3) on the output of the memory element,

said common output having at least two input terminals (e.g., element 10 of Fig. 3), means for switching the pixel's signal on the common output line and the memory element's signal to respectively third and second amplifying elements of one column (e.g., signals ϕ_{SH1} and ϕ_{SH2} and switching transistors Q_h),

means for switching the two output signals of the amplifying elements of one column to respectively first and second input terminals of said common output (e.g., element 8 of Fig. 3).

Yonemoto does not explicitly disclose, nor preclude, that subtracter 10 is an amplifier. As is very well known and established in the art Hashimoto discloses that at the output of an image sensor a differential amplifier can be used in order to subtract the signal plus noise from

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the noise (column 13, lines 9-16; Fig. 3B). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have made Yonemoto's subtracter a differential amplifier in order to fully define Yonemoto's invention and perform the operation of subtracting signal plus noise from noise.

In regards to claim 2 Yonemoto discloses an image sensor as recited in claim 1, wherein said switching means comprises at least one cross-bar switch (e.g., element 8 of Fig. 3).

In regards to claim 3 Yonemoto discloses an image sensor comprising an array of rows and columns of pixels, all the pixels of one column of the array being connected to at least one common pixel output line having at least one memory element and at least one amplifying element, all of these amplifying elements being connected to a common output amplifier (e.g., see examiner notes on the rejection of claim 1), characterized in that before the amplifying element, the common pixel output line is divided through switches in at least two parallel circuits, at least one circuit having said memory element (e.g., Examiner notes that there is implied switches associated with memory elements 6a and 6b and signals $\phi SH1$ and $\phi SH2$, wherein memory elements 6a and 6b form parallel circuits and memory element 6b is the claimed memory element).

In regards to claim 4 Yonemoto discloses an image sensor as recited in claim 3, wherein both circuits have a memory element (e.g., elements 6a and 6b of Fig. 3).

In regards to claim 6 Yonemoto discloses a method of reading out an array of rows and columns of pixels of an image sensor according to claim 1, comprising the steps of:

amplifying the output signals of essentially each pixel of one column in the first amplifying element thereby obtaining a set of amplified pixel output signals (e.g., Examiner

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notes that in Fig. 3 the output of the 1H delay is labeled as pixel signal plus noise signal; column 7, line 9 – column 8, line 30),

amplifying the reference signals of essentially each pixel of one column in the second amplifying element, thereby obtaining a set of amplified pixel reference signals (e.g., Examiner notes that in Fig. 3 the minus input to the subtracter is labeled as noise signal; column 7, line 9 – column 8, line 30),

consecutively, for essentially each pixel of said column imposing the amplified pixel output signal to a first or a second terminal of said common output amplifier and imposing the amplified pixel reference signal to a second or a first terminal of said common output amplifier, while switching the amplified pixel output signal to respectively said first and said second terminals for essentially each consecutive pixel of said column, said reference signal being imposed to the other terminal of said output amplifier (e.g., Fig. 3; column 6, lines 59-66).

In regards to claim 7 Yonemoto discloses a method of reading out an array of rows and columns of pixels of an image sensor as recited in claim 3, comprising the steps of:

sampling the signal in a first phase and storing it in a memory element

sampling the signal in a second phase and possibly storing it in another memory element

subtracting said first signal from said second signal in a unique output circuit (e.g., Refer to examiners rejections of the above claims; Fig. 3).

In regards to claim 8 Yonemoto discloses the method as recited in claim 7, wherein said first phase is the reset phase and said second phase is after the integration period (e.g., Refer to examiners rejections of the above claims; column 7, line 9 – column 8, line 30).

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Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

(USPN 6,188,093 to Isogai et al)

(USPN 5,339,106 to Ueno et al)

(USPN 5,585,652 to Kamasz et al)

(USPN 4,843,473 to Bencuya et al)

(USPN 5,942,774 to Isogai et al)

(USPN 5,790,191 to Zhang)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian C. Genco who can be reached by phone at 703-305-7881 or by fax at 703-746-8325. The examiner can normally be reached on Monday thru Friday 8:00am to 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Christensen can be reached on 703-308-9644. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the technology center 2600 customer service office whose telephone number is 703-306-0377.

April 3, 2003



**ANDREW CHRISTENSEN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600**

Brian C Genco
Examiner
Art Unit 2615